PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference M/44311-PCT	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP 03/13108	International filing date *(day/month/year)* 21.11.2003	Priority date *(day/month/year)* 22.11.2002
International Patent Classification (IPC) or both national classification and IPC A01N47/06		
Applicant BASF AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
21.06.2004	14.03.2005
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Muellners, W Telephone No. +31 70 340-3289

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP 03/13108

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-11 as originally filed

Claims, Numbers

1-7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-7
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-7
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-7
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reference is made to the following documents:

D1: DE 12 22 045 B
D2: US-A-4 215 140
D3: DD 11 045 A
D4: US-A-3 180 790
D5: US-A-2 676 129
D6: US-A-4 197 311

Support by the description

Claims 1-3 and 5 are not supported by the description (Article 6 PCT) since they cover also uses and methods relating to the control of nematodes which are not plant-pathogenic. The requirements for the control of nematodes pathogenic for humans and animals are so considerably different that the disclosure in the description does not support extension to the control of nematodes in general.

Novelty

The subject-matter of claims 1-7 is new in the sense of Article 33(1) and 33(2) PCT.

Independent claim 1 relates to the use of C_{1-8}-alkyl-cyanomethyl-trithiocarbonates for the control of nematodes, independent claims 5 and 6 relate to corresponding methods for the control of nematodes and the protection of plants against nematodes respectively. The depending claims specify the preferred trithiocarbonates (C_{1-4}-alkyl, n-butyl-esters) and the nematodes (*Meloidogyne, Heterodera, Globodera* species).

None of the cited documents discloses such a use or method.

D1 discloses the use of alkyl-chloromethyl-di- or tri-thiocarbonates as insecticides and nematicides.
D2 discloses alkyl cyanomethyl-trithiocarbonates, like for instance the n-butyl ester, as insecticides, in particular against Diptera.
D3, D4 and D5 disclose the use of alkyl-trithiocarbonates, e.g. bis-hydroxyethyl-trithiocarbonate, as nematicides.
D6 discloses the use of alkyl- or benzyl-cyanomethyl-trithiocarbonates as ovicidal agents

for controlling insects and acarina.

Inventive step

The subject-matter of claims 1-7 involves an inventive step in the sense of Article 33(1) and 33(3) PCT.

In the light of the description and the closest prior art the problem underlying the invention can be seen as the provision of further alkyl-trithiocarbonate comprising agents for controlling plant pathogenic nematodes.
The proposed solution according to claim 1 is characterised by the use of alkyl-trithiocarbonates in which one of the ester groups is cyanomethyl.

The closest prior art of D1 discloses that alkyl-trithiocarbonates in which one of the ester groups is chloromethyl shows insecticidal as well as nematicidal activity against plant pathogenic nematodes like *Meloidogyne spec.* (see the passages cited in the search report). That alkyl-trithiocarbonates including those with substituted alkyl groups have nematicidal properties is also known from documents D3-D5 (see the passages cited in the search report)
From D2 it is already known that alkyl-trithiocarbonates, in which one of the ester groups is cyanomethyl and the alkyl is for instance n-butyl, do also have insecticidal activity.
Document D6 does further disclose the ovicidal activity of such alkyl- or benzyl-cyanomethyl-trithiocarbonates against eggs of insects and acarina.
The skilled person would therefore have expected that the cyanomethyl compounds of D2 would also be suitable for controlling plant nematodes and would thus provide a solution to the problem specified above.

However the skilled person would not have expected that these cyanomethyl derivatives in comparison with the structurally closely related trithiocarbonates known from the closest prior art of D1 would be more effective. The applicant has proven this exemplary for the action of butyl-cyanomethyl-trithiocarbonate in comparison with the butyl-chloromethyl-trithiocarbonate of D1 against *Meloidogyne incognita* and *M. hapla* on tomatoes in a Test Report made available to the International Examination Authority.
Such an unexpected effect is indicative of involvement of an inventive step for the claimed subject-matter.

Industrial applicability

The subject-matter of claims 1-7 is considered to be industrially applicable (Article 33(1) and (4) PCT).